

REMARKS

Claims 1 through 15 are currently pending in the application.

This amendment is in response to the Final Office Action mailed on April 26, 2002.

Claims 1 through 15 stand rejected.

Applicant has amended claims 1 and 15 and respectfully requests reconsideration of the application as amended herein.

35 U.S.C. § 102 Anticipation Rejections

Claims 1, 4, 5, 7, 8 and 15 were rejected under 35 U.S.C. § 102(e) as being anticipated by the Admitted Prior Art by Applicant (Figs. 16-18).

Applicant submits that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Fig. 16 teaches a prior art semiconductor assembly, wherein a technique of face-down attachment of a semiconductor die 232 onto a semiconductor substrate 234 with an adhesive tape 236 has been utilized. With this technique, the semiconductor substrate 234 has an opening 238 therethrough with electrical connections 240 (shown as bond wires) extending through the opening 238 to connect the bond pads 242 on an active surface 262 of the semiconductor die 232 to the traces 244 on an active surface 250 of the semiconductor substrate 234. The adhesive tape 236 used in these assemblies is **generally narrow and does not extend to an edge 252 of the semiconductor substrate 234**. Further, the opening 238 is filled and the electrical connections 240 are covered with a glob top material 256 injected into the opening 238, as shown in FIG. 17. Also, as shown in FIG. 18, an encapsulant material 258 is molded over the semiconductor die 232.

In contrast to such prior art, presently amended Claim 1, recites, *inter alia*, “at least one adhesive tape interposed between and attaching said semiconductor die active surface and said semiconductor substrate first surface, wherein a width of said at least one adhesive tape extends at least **proximate an edge** of said at least one semiconductor die **to an edge of said at least one semiconductor substrate opening.**” (Emphasis added). Figs. 16-18 of Applicant’s disclosure do not contain each and every element of presently amended independent Claim 1. Specifically, none of the prior art figures describe or show an adhesive tape that extends at least proximate an edge of at least one semiconductor die to an edge of at least one substrate opening.

Therefore, the prior art does not describe, either expressly or inherently, each and every element of presently amended independent Claim 1 under 35 U.S.C. § 102. Accordingly, Claim 1 is allowable. Claims 4, 5, 7, and 8 are each allowable, among other reasons, as depending either directly or indirectly from independent Claim 1, which is allowable.

Similarly, independent Claim 15 recites, *inter alia*, “at least one adhesive tape interposed between and attaching said semiconductor die active surface and said semiconductor substrate first surface, wherein a width of said at least one adhesive tape extends at least proximate an edge of said at least one semiconductor die **to an edge of said at least one semiconductor substrate opening.**”

As discussed herein above, none of the prior art figures show an adhesive tape that extends at least proximate an edge of at least one semiconductor die to an edge of at least one substrate opening. Accordingly, independent Claim 15 is allowable because each and every element of the claimed invention is not described in the cited prior art to anticipate the presently claimed invention under 35 U.S.C. § 102.

Applicant respectfully requests that the 102(e) rejections of claims 1, 4, 5, 7, 8, and 15 be withdrawn and the claims allowed.

35 U.S.C. § 103 Obviousness Rejections

Applicable Authority

The basic requirements of a *prima facie* case of obviousness are summarized in MPEP §2143 through §2143.03, *i.e.*, in order “to establish a *prima facie* case of obviousness, three basic criteria must be met: First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success in combining the references. Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the expectation of success must both be found in the prior art, and not based on Applicants' disclosure.” *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Further, in establishing a *prima facie* case of obviousness the initial burden is placed on the examiner. “To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.” *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). See also MPEP § 706.02(j) and § 2142.

The Supreme Court has established the standard of patentability to be applied in obviousness rejections in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966). This standard has been summarized in MPEP § 2141 into four factual inquiries including “(A) determining of the scope and contents of the prior art; (B) ascertaining the differences between the prior art and the claims in issue; (C) resolving the level of ordinary skill in the pertinent art; and (D) evaluating evidence of secondary considerations.” It should be noted that, when applying the required patentability standards of *Graham*, the basic considerations which apply to obviousness rejections based on 35 U.S.C. § 103 should include the following principles of patent law: “(A) the claimed invention must be considered as a whole; (B) the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; (C) the references must be viewed

without the benefit of impermissible hindsight vision afforded by the claimed invention; and (D) reasonable expectation of success is the standard with which obviousness is determined.” *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

Obviousness Rejection Based on Admitted Prior Art in view of Admitted Prior Art

Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Admitted Prior Art (APA of Figs. 16-18) in view of the Admitted Prior Art (APA of Fig. 15). Claim 6 depends from presently amended independent claim 1 and thus incorporates all of the limitations thereof by way of dependency.

Applicant respectfully submit that APA does not support a *prima facie* case of obviousness of claim 6 because (i) there is no suggestion or motivation, either in the APA itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings or (ii) APA does not teach or suggest all the claim limitations recited in claim 6.

The prior art teachings of Figs. 16-18 of Applicant’s disclosure are discussed *supra*. As to the subject matter recited in presently amended claim 1, FIGS. 16-18 of APA do not teach or suggest, *inter alia*, “at least one adhesive tape interposed between and attaching said semiconductor die active surface and said semiconductor substrate first surface, wherein a width of said at least one adhesive tape extends at least proximate an edge of said at least one semiconductor die to **an edge of said at least one semiconductor substrate opening.**” Further, there is not suggestion or motivation based on APA or in the knowledge generally available to one of ordinary skill in the art, to modify APA to arrive at the subject matter recited in the presently amended claim 1. A finding of obviousness in the invention recited in the presently amended independent claim 1 can only be justified by use of the benefit of impermissible hindsight vision afforded by the Applicant’s claimed invention—a procedure contrary to current principles of patent law (cf. *Hodosh*, *supra*).

Dependent claim 6 is not made obvious by APA, among other reasons, because of its incorporation of all the limitations recited in the presently amended claim 1. Therefore, Applicant

respectfully requests that the 103(a) rejection of claim 6 be withdrawn and the claim passed to allowance.

Obviousness Rejection Based on Admitted Prior Art in view of Yaguchi et al.

Claims 2, 3, and 9 through 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Admitted Prior Art (APA of Fig. 18) in view of Yaguchi et al (“Yaguchi”). (WO 97/01865). Claims 2, 3, and 9 through 14 depend from presently amended independent claim 1, thus incorporating all of the limitations thereof by way of dependency.

The Admitted Prior Art teachings have been discussed above. Yaguchi teaches various configurations of CSP-type semiconductor devices. Further, Yaguchi suggests that insulating tape pieces may be pressed against the internal lead 3 for wire bonding and resin sealing. (Yaguchi, Pg. 20, lines 15-26). In addition, Yaguchi teaches that “it is preferable to decrease the area of the tape from the viewpoint of reliability” because it easily absorbs water and is easily peeled in a package. (*Id.*, Pg. 20, lines 19-22).

Applicant respectfully submit that APA and Yaguchi, individually or in any combination thereof, do not support a *prima facie* case of obviousness of claims 2, 3, and 9 through 14 because (i) there is no suggestion or motivation, either in the prior art themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine the references teachings or (ii) APA and Yaguchi, individually or in any combination thereof, do not teach or suggest all the claim limitations recited in claims 2, 3, and 9 through 14.

As to the subject matter recited in presently amended claim 1, the combination of APA and Yaguchi fails to teach or suggest all of the limitations recited therein. In contrast to the teachings of APA and Yaguchi, individually or in any combination thereof, presently amended independent Claim 1 recites, *inter alia*, “at least one adhesive tape interposed between and attaching said semiconductor die active surface and said semiconductor substrate first surface, wherein a width of said at least one adhesive tape extends at least proximate an edge of said at least one semiconductor die **to an edge of said at least one semiconductor substrate opening.**” Yaguchi does not teach or suggest that an adhesive tape extends at least proximate an edge of at least one semiconductor die

to an edge of said at least one semiconductor substrate opening. Neither does any combination of Applicant's admitted prior art and Yaguchi teach or suggest that an adhesive tape extends at least proximate an edge of at least one semiconductor die to an edge of said at least one semiconductor substrate opening.

Further, there is no motivation to combine the Admitted Prior Art with Yaguchi, because Yaguchi teaches away from the Admitted Prior Art. Also, it is respectfully submitted that consideration of Yaguchi in its entirety teaches away from any combination with the Admitted Prior Art, and vice versa. More specifically, Yaguchi teaches that use of an adhesive tape should be minimized due to reliability considerations, as discussed herein above. Therefore, the proposed modification to Yaguchi to extend the adhesive tape proximate an edge of said at least one semiconductor die conflicts with the teachings of Yaguchi.

In contrast to Yaguchi, the Admitted Prior Art does not suggest minimizing the area of adhesive tape due to reliability considerations. In addition, the Admitted Prior Art does not teach or suggest using sections of adhesive tape to reduce the adhesive tape area. In other words, both references fail to provide any motivation for the attempted combination. It should be noted that it "is improper to combine references where the references teach away from their combination." M.P.E.P. §2145(X)(D)(2) (citing *In re Grasselli*, 713 F.2d 731, 743, 218 U.S.P.Q. 769, 779 (Fed. Cir. 1983)). A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 220 U.S.P.Q. 303 (Fed. Cir. 1983), *see also* MPEP § 2141.02.

Therefore, APA and Yaguchi, individually or in any combination thereof, do not make obvious the subject matter recited in the presently amended independent claim 1, nor do they establish a *prima facie* case of obviousness under 35 U.S.C. § 103. Accordingly, claims 2, 3, and 9 through 14 are each allowable, among other reasons, as depending directly or indirectly from independent Claim 1. Applicant respectfully request that the 103(a) rejection of claims 2, 3, and 9 through 14 be withdrawn and the claims passed to allowance..

Applicant requests entry of this amendment for the following reasons:

The amendment is timely filed.

The amendment reduces the number of issues for any subsequent appeal.

The amendment does not require any further search or consideration.

The amendment places the application in condition for allowance.

Applicant submits that claims 1 through 15 are clearly allowable over the cited prior art.

Applicant requests the allowance of claims 1 through 15 and the case passed for issue.

Respectfully submitted,



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JRD/sls:djp

Enclosure: Version with Markings to Show Changes Made

N:\2269\3818.1\Amendment Under 37 CFR 1.116.wpd

APPENDIX A

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

A marked-up version of each of the presently amended claims, highlighting the changes thereto, follows:

1. (Four Times Amended) A semiconductor die assembly comprising:
a semiconductor substrate having a first surface and a second surface, wherein said semiconductor substrate includes at least one opening defined therethrough between said semiconductor substrate first surface and said semiconductor substrate second surface;
at least one semiconductor die having an active surface with at least one electrical connection area disposed on said semiconductor die active surface, said at least one semiconductor die oriented having said at least one electrical connection area substantially aligned with said at least one semiconductor substrate opening; and
at least one adhesive tape interposed between and attaching said semiconductor die active surface and said semiconductor substrate first surface, wherein a width of said at least one adhesive tape extends at least proximate an edge of said at least one semiconductor die to [at least proximate] an edge of said at least one semiconductor substrate opening.

15. (Three Times Amended) A computer comprising:
at least one semiconductor die assembly, said semiconductor die assembly comprising:
a semiconductor substrate having a first surface and a second surface, wherein said semiconductor substrate includes at least one opening defined therethrough between said semiconductor substrate first surface and said semiconductor substrate second surface;
at least one semiconductor die having an active surface with at least one electrical connection area disposed on said semiconductor die active surface, said at least one semiconductor die oriented having said at least one electrical connection area substantially aligned with said at least one semiconductor substrate opening; and

at least one adhesive tape interposed between and attaching said semiconductor die active surface and said semiconductor substrate first surface, wherein a width of said at least one adhesive tape extends at least proximate an edge of said at least one semiconductor die to [at least proximate] an edge of said at least one semiconductor substrate opening.